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ABSTRACT

This report reviews literature and presents evidence and findings from empirical studies and syntheses that encompass a wide range of contexts and topics relating to school effectiveness. The body of the report is arranged in seven sections. The introduction discusses the need for effective schools, and the concepts of effectiveness, efficiency, and quality, with a note on the methodology of school-effectiveness research. Section 2 presents evidence on a range of specific interventions: multigrade schools, preprimary education, school physical facilities, interactive radio instruction, textbooks and materials, and health. Section 3 looks at some curriculum and assessment issues: the relation of curriculum content to economic growth, vocational education, and examination reform. In section 4, factors influencing teacher effectiveness are considered. Section 5 presents evidence from general studies and reviews of school effectiveness in developing countries. Section 6 summarizes some relevant research from developed countries. Finally, Section 7 is devoted to policy implications. Appendix A is an extract from the Terms of Reference, and Appendix B is a table illustrating educational efficiency in developing countries. (Contains 57 references.) (RT)

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EDUCATION RESEARCH

SCHOOL EFFECTIVENESS IN DEVELOPING COUNTRIES:

A SUMMARY OF THE RESEARCH EVIDENCE

Serial No. 1

David Penny cuick

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David Pennycuick
Centre for International Education
University of Sussex

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Department For International Development

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PREFACE

The work of producing this report on school effectiveness research in developing countries was funded by the ODA and an extract of the terms of reference is at Appendix A. It must be said that in the current state of knowledge it does not seem possible to meet the objectives of the terms of reference with a high degree of precision. While much is known about the factors which influence pupil attainment, and there is an increasing body of research evidence on school effectiveness, there is still much to be learnt. Whereas it is important for decision makers to be aware of the evidence which exists, policy formulation still requires a considerable degree of judgement, taking account of a wide range of contextual factors.

The report takes the form of a literature review, and presents evidence and findings from empirical studies and synthetic reviews which between them cover a wide range of contexts and of topics relating to school effectiveness. In the limited time available for writing the report it has been necessary to be selective, and I should be grateful to know of any major omissions in the literature cited. In any case, in view of the importance of research in this field for education aid policy, it is desirable for the report to be updated continually as more evidence becomes available.

The body of the report is arranged in seven sections. The introduction discusses the need for effective schools, and the concepts of effectiveness, efficiency and quality, with a note on the methodology of school effectiveness research. Section 2 presents evidence on a range of specific interventions: multigrade schools, preprimary education, school physical facilities, interactive radio instruction, textbooks and materials, and health. The third section looks at some curriculum and assessment issues: the relation of curriculum content to economic growth, vocational education, and examination reform. In section 4, factors influencing teacher effectiveness are considered. Section 5 presents evidence from general studies and reviews of school effectiveness in developing countries. In section 6 some relevant research from developed countries is summarised. Finally, section 7 is devoted to policy implications.

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SECTION 1: INTRODUCTION

1.1 The need for effective schools

According to Haddad et al (1990, p3), empirical evidence suggests

> that in both developed and developing countries, educational investment has been one of the most important factors contributing to economic growth; that expenditures on education contribute positively to labour productivity; that the economic payoff to spending on education - from both a private and public standpoint - is high, in absolute terms and compared to other investments; and that increased education of parents - especially mothers - has an important impact on child health and reduced fertility at all levels of economic development.

They argue that improving access to and the quality of basic education is a priority in almost every low-income and middle-income country, and point out that, in many countries, particular attention has to be paid to girls' education.

Quality is important. Referring to work by Creemers, Peters & Reynolds (1989) and by Raudenbush & Willms (1991), Lockheed & Verspoor (1991, p19) state that

> recent research on the effect of schools on learning provides clear evidence that variations in the characteristics of schools are associated with variations in student outcomes.

They argue that to increase the pace of economic and social development in developing countries, schools must teach most school-age children the essential skills targeted by the primary curriculum, which include literacy, numeracy, communications and problem-solving skills. One of the aims of this report is to review research evidence as to how schools can best do this, and hence to indicate possible priorities for education aid. It is clear that developing countries must concentrate their resources on those improvements that are known to enhance student learning (Lockheed & Verspoor,1991).

Haddad et al (1990, p50) quote several sources to confirm that there are some consistent general findings from the research.

> Variation in school inputs, such as teacher experience, teacher motivation, the presence of textbooks, homework, and time spent in school during the year do contribute to varying pupil achievement, even when family background differences are accounted for.

1.2 Effectiveness and efficiency

Bacchus (1991) identifies three major thrusts in efforts to improve the quality of basic education:

> * raising the academic performance of students in the various subjects offered in schools with the currently available resources. Such efforts are often referred to as attempting to improve the 'internal efficiency' of the schools.
>
> * providing children with education that is most likely to help them improve the quality of their lives when they become adults. .... This approach is often referred to as attempting to raise the 'external efficiency' or the 'effectiveness' of schools.
>
> * increasing the rate of school enrollment by providing more school places and reducing the inequalities which currently exist between the sexes and between different regions in a country. ....
>
> (Bacchus,1991, pp 5-6)

There is a danger of confusion when defining the terms 'efficiency' and 'effectiveness' and their descriptors 'internal' and 'external'. According to Lockheed & Hanushek (1988, p22),

> Efficiency refers to a ratio between inputs and outputs. A more efficient system obtains more output for a given set of resource inputs, or achieves comparable levels of output for fewer inputs, other things equal. .... The output of education refers to that portion of student growth or development that can reasonably be attributed to specific educational experiences.

Inputs are conceived in broad terms, to include the complex interactions of students and teachers, as well as text-books, teachers' salaries, and so forth. Lockheed & Hanushek restrict the term 'efficiency' to monetary inputs and use 'effectiveness' for non-monetary inputs. Outputs expressed in non-monetary terms (e.g. learning) are 'internal' and outputs expressed in monetary terms (e.g. earnings) are 'external'. Hence external efficiency is equated with a cost-benefit ratio. Unfortunately, the classification is marred by equating internal effectiveness with 'technical efficiency', and internal efficiency with 'cost-effectiveness'!

There are obvious difficulties with these definitions. For example, it is arguable as to exactly what should count as inputs, and how inputs might best be measured, even if all inputs are measurable. Similar difficulties apply to outputs. However, whatever precise definitions are adopted, it is clear that there are various policy options for attempting to improve the output-input ratios, for example

1) achieving existing output levels for cheaper or fewer inputs (e.g. by selecting low-cost building alternatives)

2) increasing outputs for the same inputs (e.g. by reducing absenteeism)

3) reallocating existing resources to new inputs which increase outputs (e.g. perhaps by spending less on teacher training and more on textbooks).

It must be kept in mind that efficiency is not the only criterion for policy-makers, who must take account of a range of social, political, economic and educational considerations in arriving at judgements as to

priorities for objectives and methods of achieving them. Nevertheless as Lockheed & Hanushek (1988, p21) point out

> When there are limited resources - as there always are - those resources should be used to promote society's objectives as fully as possible.

They identify three important constraints on improving internal efficiency: (a) inadequate knowledge about internal effectiveness, (b) inadequate knowledge about costs in inputs, and (c) difficulty in obtaining appropriate information. Evidence on which to base decision-making is limited by these constraints.

> It is noteworthy that, while the World Bank has invested over $10 billion in education projects, research necessary to answer questions about the internal efficiency of education has been conducted in fewer than half a dozen instances.
>
> (Lockheed & Hanushek, 1988 pp27-28)

In view of the paucity of research evidence, there is a strong case for both multilateral and bilateral agencies to support more research studies related to the effectiveness and efficiency of alternative educational inputs. Lewin with Ross (1992) recommends enhancement of the ODA educational research programme support, including the generation of new knowledge of the effectiveness of intervention strategies.

1.3 Quality in education

The concept of quality in education is not easy to define. Hawes & Stephens (1990) believe that quality is characterised by three inter-related and inter-dependent strands: (i) efficiency in meeting its goals; (ii) relevance to human and environmental conditions and needs; (iii) "something more", that is the exploration of new ideas, the pursuit of excellence and the encouragement of creativity. If this is accepted, there might be debate about the relative importance of each strand, about what the goals should be, and about what is meant by "relevance". In particular one major goal might be equity, and it can be argued that equity considerations should be part of a broad view of effective schooling.

Urwick & Junaidu (1991, pp19-20) distinguish two contrasting orientations towards quality, which they describe as "technical efficiency" and "pedagogic".

> The 'technical efficiency' orientation focuses on the provision of basic school inputs (especially teachers , educational materials and learning time), their effect on academic achievement and the consequent priorities for investment. This orientation is characterised by positivist assumptions and by attempts to measure production functions through large-scale surveys. .... The 'pedagogic' orientation towards the quality of education does not give much emphasis either to physical inputs or to their 'effects', but rather sees teaching skills, patterns of school organization and curricular content as the essential components of 'quality.

In practice, there is a danger of over-emphasis on efficiency and on the use of quantitative indicators. Tipple (1990) points out the tendency to restrict to what can be measured, and argues that 'the measurable thus assumes unwarranted importance'. Wilcox (1990, p39) warns that

> Performance indicators .... will seldom if ever tell an unambiguous tale. Quality of educational experience will always be an elusive entity which evades precise delineation.

Wilcox suggests a range of possible indicators, including client satisfaction (using questionnaires) and qualitative indicators based on observation by advisers or inspectors in addition to achievement scores. The notion of 'value added' is important in making comparisons of assessment test results. In other words, the effectiveness of a school depends not just on the final results of the students, but on what improvements in performance have been achieved by those students while at the school. Indicators should take account of the social and economic contexts of the schools.

Vulliamy (1987, pp220-221) takes the view that in discussing effectiveness we should always ask "effectiveness for what and for whom?", and argues that

> The notion of effectiveness presupposes a consensus on the desired outcomes of schooling, which tends to disembody schools from their wider social, political and economic context. ..... In the Papua New Guinean context, for example, it may be that a school with relatively poor examination results is providing a relatively better preparation than other schools for those of its students who are likely to return home to their villages.

It is true that most school effectiveness research uses examination or other test results as the indicator of quality. Nevertheless, according to Singh (1991, p70),

> The accumulation of research findings and evaluations of development projects have brought together a wealth of knowledge about the essentials for quality schooling.

Singh quotes Throsby & Gannicott (1990) that the following statements encapsulate the state of thinking on quality in education:

* trained teachers make a difference
* class size is not relevant
* the provision of instructional materials is one of the most cost-effective ways of raising the quality of education
* education is most effective if initial instruction uses the mother tongue
* lavish buildings and equipment will not raise quality
* curriculum reform will not necessarily raise

educational quality

* examinations are a useful way of monitoring school quality

* healthy well-fed children learn better

* amount of learning time affects educational outcomes

* quality depends on good decentralised education management

These points are discussed in more detail in later sections.

1.4 Methodology of school effectiveness research

Various aspects of research methodology need to be taken into account when evaluating the evidence to be presented in this summary report, and when applying the evidence in policy formulation. Firstly, a narrow range of output variables is used in much of the research, with test and examination results featuring prominently. It could be argued that these proximate outputs do not necessarily give an accurate prediction of more important remote outputs, such as whether school leavers become good citizens, or make a positive contribution to national development. It might also be argued that more attention should be paid to process variables such as the quality of school management and that an input-output model is too simplistic (Willms,1992).

If these arguments are accepted, it might be felt that there is a need for more qualitative research. Some examples of predominantly qualitative studies are quoted in this report (e.g. Vulliamy,1987; Levin & Lockheed,1991; Urwick & Junaidu,1991), but the majority of the cited literature is based on quantitative work.

Not everyone would feel that the scientific paradigm (within which much quantitative work is located) is always appropriate. There are methodological difficulties, although it is claimed that the new multilevel models overcome many of them (see Riddell,1989 and Heyneman,1989 for a discussion). There are also difficulties of interpretation: for example, establishing a statistically significant correlation between two variables does not establish causality. Another point is that some studies (especially transnational studies) have problems of aggregation.

A further point made by Keith Lewin (personal communication) is that

> very often the various studies treat factors as separate entities where variance is unproblematic. It makes a great deal of difference how school size, for example, varies from place to place. Treating things like the existence of textbooks or science laboratories dichotomously often loses important dimensions of school quality related to how they are distributed. A futher problem related to this at the policy level is that, whatever the difficulties of disaggregation, it will generally be the case that selected inputs on the margin have far more effect than flat rate increases.

None of these caveats mean that existing research evidence should be rejected; it is the best evidence we have. However, it is important that it should not be applied blindly or prescriptively, but rather used to assist decision making, with due attention to context. On the other hand, it can be said with confidence that policy-makers who ignore the research evidence take a considerable, and unjustifiable, risk.

SECTION 2: SPECIFIC INTERVENTIONS

2.1 Multigrade schools

Multigrade schools combine students of different ages and abilities in one classroom, under the direction of one teacher (Thomas & Shaw, 1992).

> Multigrade schools are a cost-effective way of providing a complete educational cycle in sparsely populated areas and for maintaining services in areas with declining populations. If properly implemented, multigrade schools offer considerable scope for reducing unit costs while maintaining or even improving quality. (Thomas & Shaw, 1992, p31)

Thomas & Shaw identify four critical elements for effective implementation, the first of which is the most important: (1) teachers need to adopt more effective teaching practices to make multigrade schools function properly; (2) to do so, they require adequate material and physical inputs of which programmed learning materials and textbooks are of overwhelming importance; (3) local and regional support networks need to be developed among teachers; and (4) there must be national level support for pilot programs, including both financial support and active involvement of a few key multigrade advocates.

2.2 Multiple-shift schooling

In a multiple-shift system, schools cater for two or more entirely separate groups of pupils during a school day (Bray, 1989).

> Multiple-shift systems can be highly cost-effective. They can permit substantial financial savings, and do not necessarily cause a decline in quality. And even when introduction of multiple-shift schooling does cause some loss of quality, the benefits of reduced unit costs and of larger enrolments may outweigh the cost implied by the loss of quality. (ibid, p93)

However, Bray stresses that, if multiple-shift systems are to operate cost-effectively, education authorities must give due consideration to a range of factors (choice of model, management structures, hours of schooling, out-of -school learning, use of teachers, extra rooms, use of other community facilities). Bray also points out that "multiple-shift schooling is rarely popular with the general public" (p98), and there is a need to take account of the social and political context in policy-making.

2.3 Preprimary education

> There is considerable evidence from research in developing nations that well-conceived, well-implemented preprimary educational programs can significantly increase the cognitive outcomes children obtain during their primary school years.
> (Raudenbush et al, 1991, p255)

As an example, they give evidence from Thailand which shows the following effects of preprimary education on achievement in mathematics and in the Thai language:

maths	urban	0.15 SD units (see Appendix B, note a)
	rural	0.08 SD units
Thai	urban	0.16 SD units
	rural	0.10 SD units

The cost per head per year in 1985 was $US249.64 for 2-year kindergartens, $US164.80 for 1-year preprimary schools, and $US91.56 for child care centres. These costs are not cheap in comparison with unit costs for primary education in many countries (eg. in sub-Saharan Africa). Preprimary education for all may not, therefore, be an attractive investment policy option.

Nevertheless, Lockheed & Verspoor (1991) regard preschools as a 'promising avenue' for improving learning achievement, and draw attention to the role of preprimary education in combating poverty, for example in Latin America. Targeting preprimary education on specific underprivileged groups can help towards greater equity by reducing differences between different groups of students on entry to primary school. Conversely, however, pre-schools can act to ncrease performance differences if they are available mainly to children of relatively wealthy parents.

2.4 School physical facilities

Although buildings, furniture and equipment accounted for almost 30% of aid for primary education in the period 1981-86 (Lockheed & Verspoor, 1991) there is relatively little research evidence on the effects of school physical facilities in developing countries. Surprisingly, Lockheed & Verspoor do not focus on this topic, although they advocate the use of local materials, and mention that 'building latrines is another strategy that might increase enrollment, particularly of girls' (p155). However they argue that priorities differ among countries and 'while providing textbooks is of the utmost urgency for some countries, upgrading the physical plant is more important for others' (p217).

There is some empirical research evidence. Mwamwenda & Mwamwenda (1987) found that availability of classrooms, desks, seats and books all produce a significantly better performance in Standard 7 examinations in Botswana. They argue that this research supports the argument that school facilities are integral to academic achievement, unlike studies carried out in the West suggesting that school facilities have no impact on achievement.

Urwick & Junaidu (1991) are critical of aspects of the methodology of the Botswana study, and conducted a qualitative study of Nigerian primary schools. Their findings 'illustrate the existence of multiple links between the quality of school facilities and a number of educational process variables which are widely considered to be important determinants of the quality of schooling'. Firstly, they found that four

aspects of teaching (the extent to which teaching methods were pupil-centred, the variety of activities organized during lessons, the variety of methods of communication used during lessons, and the frequency with which assignments and homework were set) were affected by the provision of textbooks, teaching aids, writing materials and furniture. A second group of classroom learning conditions was the time required for learning activities to take place, orderliness and ease of movement in the classroom, pupil attentiveness, and pupils' opportunities for developing reading and writing skills. These were affected by many aspects of the school facilities: ancillary services such as first aid, toilets, water supply, classroom maintenance, textbook and furniture availability, space. Thirdly, effects were noted for three school variables: breadth of the basic curriculum, the range of co-curricular activities, and teacher morale. Indifference of the teachers in the more deprived schools was a major factor here, and morale was influenced by the physical condition and appearance of the school.

School facilities also emerged as a factor in the case study research of Vulliamy (1987), conducted in Papua New Guinea secondary schools.

> The argument in the First World literature that levels of resourcing and of physical facilities are unrelated to student achievement does not seem to be applicable in the Third World context. .... The lack of the most basic facilities in many Third World schools ..... not only depresses staff and student morale but also acts as an impediment to effective teaching and learning.
>
> (Vulliamy, 1987, pp219-220)

There would seem to be a strong case for further research on the effects of school facilities.

2.5 Interactive radio instruction

In interactive radio, instructional materials and delivery strategy are highly coordinated, and students give frequent active responses. It is clear that, although interactive radio has not been implemented widely, it is effective, very cost-effective, and teachers are enthusiastic about it (Lockheed & Hanushek,1988; Hallak,1990; Lockheed & Verspoor,1991). Lockheed & Verspoor give examples from various sources with effect sizes ranging from 0.53 S.D. units to 1.31 S.D. units (these statistics are calculated by taking the mean score of the radio class, subtracting the mean score of the control group, and dividing by the standard deviation of the control group).

2.6 Textbooks and materials

According to Fuller & Heyneman (1989, p12),

> teaching materials and related material inputs that are linked directly to teaching are related consistently to higher pupil achievement, after controlling for the influence of family background.

Lockheed & Verspoor (1991) also report that the availability of textbooks and other instructional materials has a consistently positive effect on student achievement in developing countries. They recommend the provision of good textbooks and teacher guides as a "promising avenue" for policy-makers. Computers in the classroom, however, are regarded as a "blind alley". Although they can be effective in the right conditions, the costs are much too high.

Several pieces of research on the effectiveness of textbooks have been carried out. For example, Heyneman et al (1984) evaluated a textbook program in the Philippines, which they describe as a large-scale investment in school quality improvement. The program reduced the ratio of pupils per book per subject from an average of 10:1 to 2:1. Three subjects and two grades were involved. The overall effect of the first year investment in textbooks was to raise the national level of academic achievement as follows:

	grade1	grade2
Pilipino	0.32	0.18
maths	0.30	0.32
science	0.51	0.46

The improvements in achievement are measured in S.D. units, and this represents a sizeable impact. In the case of grade 2 Pilipino, Heyneman et al found evidence that the textbooks may have been too difficult. Further improvements were not observed by a further improvement of the pupil-textbook ratio to 1:1. Another interesting finding of this evaluation was that

> the effect of a school quality intervention appears to be the most pronounced among the children who are most impoverished and whose home backgrounds are the most underprivileged. (p150)

Lockheed et al (1986) analysed longitudinal data from a sample of eighth grade mathematics classrooms in Thailand, and concluded:

> This paper confirms that textbooks contribute to student learning in developing countries and identifies two important mechanisms whereby this contribution may be made: by substituting for postsecondary teacher education, and by delivering a more comprehensive curriculum. We found little evidence that textbooks enabled teachers to make better use of classroom time, however, or that they encouraged the assignment or completion of homework. (p379)

They argued also that educational policies favouring postsecondary education for teachers of lower secondary school may not be appropriate under conditions in which essential teaching materials are lacking.

More generally, Hallak (1990, p220) states that

> Textbooks are the instructional device par excellence, and central to teaching. In the least developed countries, they often constitute 85% of recurrent expenditure on materials. Classrooms deprived of textbooks promote little in the way of reading skills, and are obliged to content themselves with rote learning, recitation, copying from blackboards and taking lecture notes.

Hallak points out that constraints affecting all categories of costs - design, testing, production, distribution and use - must be considered at all levels. The cost-effectiveness of textbooks is considered by Lockheed & Hanushek (1988) - see section 5 of this report.

2.7 Health and school effectiveness

Lockheed & Verspoor (1991, p74) review research relating to the role of health in promoting student achievement.

> Several studies have explored the relationship between children's nutritional status and school indicators such as age at enrollment, grade attainment, absenteeism, achievement test scores, general intelligence, and performance on selected cognitive tasks, including concentration in the classroom. Three aspects of nutritional status affect achievement adversely: protein-energy malnutrition, temporary hunger, and micronutrient deprivation.

They argue that all three aspects can be easily and efficiently treated in schools. Supplementary feeding is the most commonly applied intervention for the first two, and is best applied in the form of modest school snacks or breakfasts. Providing school lunches, rather than breakfasts or snacks, is of questionable value.

For micronutrient deficiencies, iron, iodine, and vitamin A supplements and deworming are the prevalent treatments. Lockheed & Verspoor take the view that such supplements should be given a high priority where deficiencies are present. On deworming, maximum benefit-cost ratios are achieved when deworming is combined with sanitation, a clean water supply, and health education.

Finally, Lockheed & Verspoor recommend visual and auditory screening, but state that cost-benefit ratios are favourable only if the appropriate classroom management techniques are applied once a problem is discovered.

SECTION 3: CURRICULUM AND ASSESSMENT

3.1 Curriculum content and economic growth

A very interesting study by Benavot (1992) seeks to determine whether, and to what extent, national variations in curricular content and structure significantly affect economic development. The research was based on the formally prescribed primary curriculum in over 60 nations, including 43 less-developed countries. According to Benavot,

> Cross-national studies show that mass educational expansion has a significant positive effect on economic growth, mainly at the primary level, but also at the secondary level. Qualitative features of national school systems such as the provision of textbooks, per-pupil expenditure, and the extent of teacher training also have modest economic effects, especially in the developing world. (p150)

The question is whether variations in national curricular policies, independent of student achievement levels, have significant, aggregate-level impacts on macroeconomic change.

> Despite shaky empirical support, it is received wisdom that national variations in the composition of official and implemented curricula, by their influence on student achievement levels, have important long-term effects on the quality and productivity of the labour force and, consequently, on a nation's competitive position in the world economy. (Benavot,1992, p153)

Benavot points out that

> nations around the world, especially in the Third World, have allocated substantial - and, in most cases, increasing - amounts of instructional time to mathematics and science, the two subject areas thought to have the greatest relevance to economic and technological development. (p157)

Benavot found firstly that if less developed countries only are considered, the overall hours of instruction had a positive but non-significant relationship with economic growth. However, among nations with high primary enrollment rates, the relationship was positive and significant.

Secondly, Benavot considered the possible effects of instruction in each of eight subject areas. The findings were (for less developed countries) that science education has a significant positive relationship with economic growth. Prevocational (or practical) education has a negative relationship, which is significant only for poorer less developed countries.

There is no evidence that instructional hours allocated to either elementary mathematics or language significantly contribute to long term economic growth. In fact the direction of the regression coefficient associated with mathematics education is actually negative. However,

> those Third World countries allocating more hours to aesthetic education experienced, other things being equal, stronger growth rates; those that allocated more time to physical education experienced slower growth rates. (pp 167-168)

Benavot's main conclusion, therefore, was that

> Countries requiring more hours of elementary science education, other things being equal, experienced more rapid increases in their standards of living during the 1960-85 period. It was not established if the emphasis on science education at the primary level is the key causal factor, or if the explicit (rather than implicit) content of the subject area is the key mechanism linking the curriculum to the economy. (p173)

Benavot explains that the measure (instructional hours in elementary science) may be a proxy for some related attribute of nations.

> The economic effect of science education may have more to do with "hidden" cultural rules, orientations and worldviews being transmitted than the specific scientific content being taught. (p173)

Other conclusions from this research may be just as important in their policy implications.

> Instructional time for maths and language education, at least at the primary level, appears unrelated to long-term economic growth. Equally interesting .... is the potential importance of aesthetic education (i.e. art, music, dance, drawing) as it relates to the economic growth of certain less developed nations. (p173)

Of course it will be argued that economic growth is not the only, or even a main, aim of curriculum planning. Other aspects of educational quality, for example effectiveness and relevance, are important (see Hawes & Stephens,1990). It needs to be stressed also that only the primary curriculum was considered in the research. The findings may be thought to be counter-intuitive, and it is to be reiterated that correlation does not imply caussality.

3.2 Vocational education

The particular dilemma of vocational education (at all levels) is considered in some detail by Psacharopoulos (1987, p201):

> On the one hand, there is on the face of it a valid, and irresistibly logical, argument that the school system in developing countries should be vocationalized in order to increase its relevance to the needs of a modernizing economy. On the other hand, nearly every valuation of the performance of vocational education to meet such needs, whether in developing or industrialized countries, has been negative.

Basing his arguments on cost-benefit analysis, Psacharopoulos makes two major points. Firstly, the provision of skills does not have to be school-based, and even if it is school-based, it does not have to take place in the mainstream educational system. Secondly, students are often forced to follow a

vocational track although they would prefer an academic one. The vocational school fails because of the inherent contradiction between student preferences and the type of schooling offered.

A strong case for out-of-formal school or employment-based training is made by Psacharopoulos. In essence, the advantages are improved student motivation, training more relevant to specific needs, the burden of financing falling more on the shoulders of the beneficiaries, and lower opportunity costs because the trainee usually works part-time while studying.

One example of research in which vocational schooling was found to be more cost-effective than general academic education comes from Israel (Neuman & Ziderman, 1989). However, there is still support for Psacharopoulos' conclusions since Neuman & Ziderman also found vocational schooling to be less cost-effective than alternative non-formal training modes, notably the traditional apprenticeship and factory-based vocational schools.

More evidence on diversified secondary education is given by Psacharopoulos & Loxley (1985), based on research in Colombia and Tanzania. They found a number of positive results of diversification, including higher cognitive achievement and better labour market performance of students following diversified curricula. However, curriculum diversification is expensive and difficult to implement.

> This study has failed to provide evidence that the measurable monetary benefits of diversification are greater than those of conventional education.

They suggest that

> the lower the overall level of a country's development, the weaker the case for introducing a diversified curriculum. The more developed the country, the more it may be able to afford diversification.(ibid)

Haddad et al (1990) also distinguish different needs in different countries. For most countries they argue that,although there is economic justification for investment in vocational education, such investment should be selective, and focus much more on in-firm and firm-connected or industry-connected programs. However in the case of low-income countries (with weak enterprises and stagnant demand for skills) a different training strategy is required:

> Pre-employment training is more important, since enterprises themselves have little training capacity, and this training should be more generic, focusing on general academic preparation ..... and on self-employment and entrepreneurship. (Haddad et al, 1990, p49)

> Although this sounds logical, it may not be easy to develop the skills and opportunities needed for self-employment to become a reality for large numbers of school leavers.

3.3 Examination reform

Turning to assessment, it is clear that examinations and other forms of assessment can have a significant impact on the quality of education. According to Heyneman (1987), "selection examinations play an important role in a nation's economic development". He argues that countries should use examinations to improve classroom pedagogy, and that

> Despite differences in size and financial resources, school systems in developing countries, without exception, require a professional capacity in the field of standardized testing and examinations. (p257)

Kellaghan & Greaney (1992) studied examination systems in 14 Anglophone and Francophone African countries, and conclude that

> Considerable reliance has been placed on public examinations in African education as a means of ensuring that teachers and students cover a common curriculum, and accordingly as a particularly effective instrument for raising academic standards.

However, they also point out that examinations may give rise to problems if validity and/or reliability are low, if there is inadequate feedback, and if there are negative backwash effects. Again,

> the high repetition rate attributable to 'failure' may represent a serious waste of scarce educational resources.(ibid)

The symptoms of the Diploma Disease (Dore,1976; Oxenham, 1984), which include qualification escalation and educated unemployment as well as negative backwash, are well-known. Nevertheless, Heyneman & Ransom (1990, p177) state that

> Examinations can be a powerful, low-cost means of influencing the quality of what teachers teach and what students learn in school. .... Examination agencies have an important role to play in increasing the effectiveness of schools.

They state three requirements for making examination backwash effects positive (a) improve the content of examinations (b) set up a good feedback mechanism to analyse and interpret student errors (c) make sure the examination body is financed and managed in such a way that it can do the first two well. Somerset (1988) discusses ways in which examinations can be used as an instrument to improve pedagogy. There are other assessment-related strategies in addition to examination reform which can be used to improve quality; these include revised selection policies and the use of continuous assessment systems (see Pennycuick, 1990 & 1991), although these must be used with caution. Another possibility is in-service training to improve the competence of inspectors and teachers in principles and techniques of student assessment. Lulsegged (1988) describes a successful example of this strategy in Swaziland.

As a result of their research, Kellaghan & Greaney (1992) offer the following recommendations:

1. Examinations should reflect the full curriculum, not merely a limited aspect of it.

2. Higher-order cognitive skills should be assessed to ensure they are taught.

3. Skills to be tested should not be limited to academic areas but should also be relevant to out-of-school tasks.

4. A variety of examination formats should be used, including written, oral, aural, and practical.

5. In evaluating published examination results and national rankings, account should be taken of factors other than teaching effort.

6. The number of public examinations should be reduced to help diminish repetition and dropout rates and the inevitable sense of failure experienced by students.

7. The amount of time teachers spend on testing and preparing for public examinations should be lessened to provide more time for teaching.

8. Detailed, timely feedback should be provided to schools on levels of pupil performance and areas of difficulty in public examinations.

9. Predictive validity studies of public examinations should be conducted.

10. The professional competence of examination authorities needs to be developed, especially in test construction.

11. Each examination board should have a research capacity.

12. Examination authorities should work closely with curriculum organizations and with educational administrators.

13. Regional professional networks should be developed to initiate exchange programs and share common interests and concerns.

14. A post-graduate degree course should be established in an African country for examination authority personnel.

Again, it may be easier to reach general agreement about these recommendations than to achieve implementation of them.

SECTION 4: TEACHER EFFECTIVENESS

Schiefelbein & Simmons (1981) reviewed research in more than 20 countries, and found that teachers without certificates in educational training had students who tested as well as those with certificates in 19 out of 32 studies. They concluded that "teacher certification should be reviewed with caution as a way to increase student achievement". They also found that years of teacher experience was a significant determinant of student achievement in only 7 out of 19 studies, and that more years of teacher training was not related to higher student achievement in 5 out of 6 studies.

These rather discouraging results have led to further research. Avalos & Haddad (1981) conducted an extensive review and argued that "it does not seem reasonable to conclude that training has no effect upon achievement". (p33)

> Qualifications and training, contrary to existing pessimism, are related to teacher behaviour and pupil achievement, although it is not known how permanent this effect is nor what the optimum levels of qualifications are.(ibid, p35)

Other findings from the Avalos & Haddad review were that some methods of teacher training (e.g. micro-teaching and simulation) appeared consistently effective in promoting changes in teaching techniques, that teacher expectations of students were important, and that

> The discovery/inquiry method ... proved in most cases to be superior in promoting higher levels of cognitive skills. ..... On lower levels of cognitive achievement, teaching through behavioural objectives was found to have an effect. (ibid, p35)

Saha (1983) reviewed empirical research studies in 21 LDCs on the relationships between teacher variables and student academic achievement. Results are summarised in the following table, in which the entries denote the number of studies demonstrating a significant positive relationship (+), no relationship (0) or a significant negative relationship (-) respectively.

	direction of relationships		
	+	0	-
demographic and background variables			
1. teacher sex male	12	1	-
female	9	6	-
2. teacher age	3	3	-
3. teacher SES	2	1	-
4. frequency of English in teacher childhood home	-	1	-
5. expatriate teachers	2	11	-
qualification variables			
6. t.educational attainment	4	7	-
7. t.credentials/certification	21	18	2
8. t.ability/achievement	5	3	1
9. teacher experience	7	3	4
10. teacher salary	3	-	-
11. t.upgrading programs	3	-	-
teacher behaviour/attitudes			
12. t.expectations of students	4	-	-
13. teaching methods (TV, microteaching, programmed instruction)	6	-	-
14. t.absenteeism/punctuality	-	2	-
15. t.attitudes toward job	2	4	-
16. t.behavior (lesson prep. & homework assignment	10	9	1

These data need to be interpreted with some care. The research was conducted over a decade ago, and there may be doubts about the methodology of some studies, or of the stability (over time) of the findings. There is little information about the strength of the relationships, or about the relative importance of the teacher variables considered. Guthrie (1982), in a meta-analysis, argued that there is considerable support for the hypothesis that there is a positive relationship between teachers' general education and professional training as independent variables and teachers' performance as dependent variable. However the exact nature of the relationship is complex and varies considerably between different educational and cultural contexts. Guthrie noted that considerable attention is needed for operational specification of the hypothesis according to the needs of individual countries.

Much teacher effectiveness research appears to be inconclusive. In a more recent example from Thailand, based on grade 5 mathematics, Nitsaisook & Postlethwaite (1986) found that the larger context of the school in general is important as well as how the students perceive the task orientation, feedback, and structuring of teachers.

> The field of teaching effectiveness research has not yet arrived at a point where it knows exactly what makes a teacher effective, and clearly further research is necessary ..... Those teachers that are task oriented and who have been trained both to deal quickly with procedural and discipline problems in the classroom and to apply certain questioning techniques in large classes are successful. (p437)

It is to be noted that Lockheed & Verspoor (1991) regard lengthy preservice pedagogical training as a 'blind alley' policy option. They argue for shortening teacher training courses, and for emphasis on inservice training. The mainground for this recommendation appears to be cost; they quote data from 27 low-income and lower-middle-income countries on the annual cost of teacher training as a multiple of general secondary education. The average ratio is 7.06, although the range is from 0.53 to a staggering 34.67! Lockheed & Verspoor summarise their chapter on Improving the Preparation and Motivation of Teachers as follows:

> A key determinant of student achievement is the quality of teaching. An effective teacher should possess at least a thorough knowledge of the subject matter being taught, an appropriate repertoire of pedagogical skills, and motivation. The teaching force in many countries fails to meet these standards. .... Governments must design policies and programs aimed specifically at improving the academic and pedagogical

preparation of teachers and providing incentives to strengthen their motivation and professional commitment. The challenge is particularly difficult for low income countries, which must not only improve the quality of the current teaching force but also expand its size if they are to achieve universal primary education.

To address the problem of inadequate academic background, countries will have to shift the general education component of teacher training to secondary schools, shorten preservice teacher training, and improve the process of recruiting students for teacher training institutions. Strategies for developing good pedagogical skills should include revising the admission requirements, emphasizing pedagogical methods, and incorporating practice teaching into preservice training. Improving teacher motivation is perhaps the trickiest task that governments face in their effort to upgrade the teaching force. Doing so will require a variety of measures, such as paying adequate salaries and providing nonsalary benefits, improving working conditions, offering opportunities for professional advancement and incentives for good performance, and strengthening supervision and support. (pp 115-6)

This last point is worth further investigation. According to Lillis (1992, p1)

> Effective inspection and supervision is seen as one key to the complex issue of improving the quality and efficiency of basic education, the quality of educational management and the quality of educational attainment.

However Lillis points out that little or no emprical evidence is available on which to judge the impact of inspection and supervision. It appears that evaluation research in this area is desirable; it is possible that appropriate training measures would be effective.

SECTION 5: GENERAL STUDIES AND REVIEWS OF SCHOOL EFFECTIVENESS IN DEVELOPING COUNTRIES

5.1 Effectiveness

Heyneman & Loxley (1983) studied science achievement in 16 developing and 13 industrialized countries, and found that

> Children who attend primary school in countries with low per capita incomes have learned substantially less after similar amounts of time in school than have pupils in high income countries. At the same time, the lower the income of the country, the weaker the influence of pupils' social status on achievement. Conversely, in low-income countries, the effect of school and teacher quality on academic achievement in primary school is comparatively greater. From these data, which are more representative of the world's population of schoolchildren than those used in previous studies, it is possible to conclude that the predominant influence on student learning is the quality of the schools and teachers to which children are exposed. (p1162)

Fuller (1987) considered more than 50 empirical studies. His review also suggests that

> the school institution exerts a greater influence on achievement within developing countries compared to industrialized nations, after accounting for the effect of pupil background. (pp255-256)

He reports that few studies have emphasized effect sizes or the efficiency with which a particular school factor boosts achievement. Almost always outcomes are measured by tests, often in reading, maths or science, but sometimes by a comprehensive examination. A table summarising Fuller's (1987) findings is reproduced in Lewin with Ross (1992, p187). Some of Fuller's specific conclusions are worth quoting here. Based on the percentage of studies showing positive effects, he found that effective parameters influencing school achievement are length of the instructional programme, pupil feeding programmes, school library activity, years of teacher training, textbooks and instructional materials. Ineffective parameters are pupil grade repetition, reduced class size, teachers' salaries, and science laboratories. For example, "in most situations, lowering class size with the intent of raising achievement is not an efficient strategy".

In the area of materials, Fuller concludes that

> A good deal of evidence now suggests that material factors in schools - such as more textbooks or writing materials - exercise more influence on achievement in the Third World than in industrialized countries.
>
> (Fuller, 1987, p287)

He finds that the influence of textbooks appears to be stronger within rural schools and among students from lower income families, but that very little research has been conducted on how, and the conditions under which, textbooks shape achievement.

These findings are consistent with those of the earlier review by Schiefelbein & Simmons (1981). They argued that there is a small number of main determinants of school achievement, but also that

> it is important to experiment with the suggested changes before policies are endorsed and implemented on a national scale.

Their results relating to teacher characteristics have been stated in section 4. Under the heading of "school resources and processes", Schiefelbein & Simmons (1981, pp10-12) found that

i) Larger class size was associated with higher performance, or did not affect it, in 9 out of 14 studies.

ii) Higher expenditure per student was not associated with higher student achievement in 5 out of 8 studies.

iii) Availability of textbooks was associated with student achievement in 7 out of 10 studies.

iv) The setting of homework was related to higher student achievement in 6 out of 8 studies.

Under the heading "student traits", they found that

v) SES was significant in 10 out of 13 studies.

vi) Malnutrition, body weight and health were significant in 8 out of 11 studies (but note that this is highly correlated with SES).

vii) The more repeating the lower the score, in 7 out of 8 studies.

viii) Kindergarten attendance was related to achievement 6 or 12 years later, in 3 out of 4 studies.

An example of research from a single country which is worth strong consideration because of its breadth of methodology and content is that of Vulliamy (1987, p 217), who found persuasive quantitative evidence of the existence of school effects on secondary school examination results in Papua New Guinea, and used qualitative case studies in an attempt to identify significant factors. According to Vulliamy, these factors are

1) quality of teaching
2) style of school administration
3) extra assistance for weak students
4) levels of staff morale
5) the provision of basic facilities (such as water and electricity)

The importance of the headteacher is paramount.

> It is now widely accepted that schools do have important effects. The research suggests that such effects are related not to resource-based school input factors, but rather to school-process factors that are more elusively categorised as features of

school climate or school culture. (Vulliamy, 1987, p217)

Another single country study was conducted in Zimbabwe by Riddell & Nyagura (1991). Their work was based on a secondary school survey and multi-level analysis. They found that student achievement is higher when schools have a greater availability of textbooks, a larger proportion of trained teachers and teachers who have taught at that school for a longer period of time.

> This suggests that raising the proportion of trained teachers and, more importantly, improving the provision of textbooks and providing incentives for teachers to remain in the same schools for a reasonable period of time are promising investment options to boost student achievement. (ibid, p51)

In a more wide-ranging study including case studies of effective schools in eight countries, Levin & Lockheed (1991) argue that flexibility appears to be key to effectiveness, and point out the importance of material inputs on achievement in economically impoverished countries.

> Resources sufficient to provide even the most rudimentary conditions for success often are lacking.

They argue that creating effective schools in developing countries requires three elements: basic inputs, facilitating conditions and the will to change. The necessary inputs are

* a well-developed curriculum, in terms of both scope and sequence;

* sufficient instructional materials for students;

* adequate time for teaching and learning

* teaching practices that encourage active student learning.

The facilitating conditions are

* community involvement;

* school-based professionalism (which includes the crucial role of the principal in school effectiveness, teacher collegiality and commitment, and autonomy balanced with accountability);

* flexibility in curriculum and organisation.

The will to act includes vision and decentralization.

Haddad et al (1990) give an extensive summary of empirical research findings; those which were published in the last decade are reproduced (in abbreviated form) in Lewin with Ross (1992, pp188-191). A particularly interesting aspect of the summary is that concerned with process factors, especially school management.

> We know that well-managed, effective schools share several characteristics: they display an orderly environment, emphasize academic achievement, set high expectations for student achievement, and are run by teachers or principals who expend an enormous amount of effort to produce effective teaching and encourage pupils to learn, no matter what their family background or gender. Few schools in developing countries display these features. (Haddad et al, 1990, p57)

Haddad et al report that

> many of those who have observed the schooling process in both developed and developing countries conclude that the most important factor governing how well pupils do in school is school management .... several studies have identified headmaster education and experience as important variables that affect pupils' achievement (ibid)

The issue of school management is discussed further in section 6.

5.2 Cost-effectiveness

According to Haddad et al (1990, p50)

> Educational production function studies have not been able to tell us accurately which school inputs have larger and smaller effects on achievement. Neither have they been particularly useful in identifying which inputs are more cost-effective than others - although "size" effects of the inputs are often a product of such studies, they rarely measure costs of inputs.

A review is given by Lockheed & Hanushek (1988). They point out that only a very few possible educational investments have been subject to analysis containing both effectiveness indicators and cost indicators, and these studies only provide examples of how decisions could be informed by such evidence. The findings of the review are reproduced in Appendix B. According to Lockheed & Hanushek (1988, pp31-34)

> Most research on instructional materials has focused on textbooks, and their cost-effectiveness has been examined in several studies. Textbooks have been found more cost-effective than (a) not having textbooks in Nicaragua and the Philippines, (b) post-secondary teacher education in Thailand and Brazil, and (c) a variety of other educational infrastructure and 'software' inputs in Brazil. .... The positive effect of interactive radio education for learning mathematics and foreign or national languages has been demonstrated in Nicaragua, Kenya, and Thailand. Radio has been found more cost-effective than conventional instructional methods relying on teachers alone. .... The cost-effectiveness of technical-vocational programs in comparison with general secondary education has been evaluated in Colombia and Tanzania, with somewhat inconsistent results. .... The evidence regarding teacher education suggests that training that emphasises basic skills is more cost-effective (vis-a-vis student learning) than training that refines skills at a higher level.

They conclude that

> On average, across several countries and a variety of student learning outcome measures, the more cost-effective interventions are textbooks, interactive radio, peer tutoring and cooperative learning. Less cost-effective are teacher training and technical-vocational schools. (ibid, p36)

Although this evidence is very interesting, and aspects of it are convincing, it should again be noted that there are methodological difficulties. The evidence on peer tutoring and cooperative learning comes from USA and Israel. It must be remembered also that there is no evidence on many other potentially cost-effective strategies, for example school management training.

SECTION 6: EVIDENCE FROM DEVELOPED COUNTRIES

A recent summary of research findings from industrialized countries is given in Riddell & Brown (1991). At the primary level, Peter Mortimore reports that it is important to take account of differences in student intake. Even when differences in intake have been taken into account, some schools are more likely than others to lead to good outcomes. Whilst attainment is influenced heavily by home background, progress is more likely to be influenced by schooling. Schools may be effective at different things, but schools effective for one group of pupils are also likely to be effective for others. Mortimore lists specific factors noted in a number of different studies which make primary schools effective:

a) Leadership The research shows that having a headteacher who is purposeful but neither too authoritarian or too democratic and who is able to share ownership of the school with colleagues is important. The quality of leadership, however, includes the ability to delegate to a deputy without feeling threatened, and to involve members of the staff in the planning and the management of the school.

b) Management of pupils Organising schools so that pupils are involved and can be rewarded for their efforts is important. The data also show that controlling behaviour with methods that are neither too weak nor too harsh is also likely to be the most effective. Ensuring that sessions are structured, work-centred and include teaching that is intellectually challenging is essential.

c) Management of teachers Involving teachers in the corporate life of the school and pursuing consistency in their approach to pupils is likely to make the school a less stressful place for both parties. Encouraging teachers to be good models of punctuality, politeness and consideration is also important, as is ensuring that classrooms have positive psychological climates in which pupils are encouraged to communicate frequently with their teachers.
Providing a broad, balanced curriculum which recognises the academic role of schooling, but also values students with special educational needs, is a difficult but crucial task. Having a limited focus within sessions in primary schools so that pupils generally work in common curriculum areas and teachers can support their learning without being 'pulled in different directions' is also difficult but appears to be highly conducive to effective learning.

d) Pupil care Treating pupils with dignity and encouraging them to participate in the organisation of the school - even at a young age - gives a positive signal that they are valued. In the same way, using rewards rather than punishment to change behaviour is important. Involving parents in the life of the school and treating education as a partnership between parents and school is likely to increase the confidence of the community in the efficiency of education. Keeping systematic records of pupil progress is crucially important if the curriculum is to have coherence for individuals.

e) School environment Ensuring that the environment is made as attractive and stimulating as possible, through taking trouble over classroom displays and removing graffiti, sound relatively simple tasks but they may have a profound effect on the attitudes of pupils attending the school.

f) School climate Endeavouring to achieve a consensus on the values shared by the school as a whole needs to be a fundamental aim. Expressing a general attitude that is positive towards learning and positive about young people will be a clear signal of what the school stands for and where its priorities lie. Establishing clear rules and guidelines for pupil behaviour and maintaining high expectations for all pupils are ways in which the goals and values of the institution are translated into daily life.
(Mortimore in Riddell & Brown,1991, pp14-15)

At secondary level, David Reynolds reports that it is clear that schools can have substantial positive effects upon young people's development if they can become more effective. Schools may be differentially effective upon different areas of pupil development, and recent findings suggest that schools can have somewhat different effects upon pupils of different backgrounds or abilities. We know much more about what generates academic effectiveness than what generates social effectiveness.

Reynolds (in Riddell & Brown,1991, pp24-25) summarises the findings of Rutter et al (1979) as follows:

'Irrelevant' factors were

* the schools' average class sizes
* the formal organisation of the academic system of the schools (e.g. having mixed ability or streamed ability grouping arrangements) or the schools' pastoral system (e.g. having form tutor or house based pupil welfare arrangements);
* school locational arrangements (e.g. being split site or not);
* the schools' sizes
* the ages and physical characteristics of the schools' buildings.

The factors that were linked with effectiveness could be grouped under the following broad headings:

* the pupil control system, with effective schools using rewards, praise, encouragement and appreciation more than punishments;
* the school environment for pupils, with

effective schools providing good working conditions for pupils and for their teachers, being responsive to pupil needs and also providing buildings that were well cared for and well decorated;

* the involvement of pupils, with effective schools giving ample opportunities for pupils to take positions of responsibility and to participate in the running of the school and in the educational activities within the classrooms;

* the academic development of pupils, with effective schools making positive use of homework, setting clear and explicit academic goals, and with the teachers in these effective schools having high expectations of, and positive views of, the capabilities of their pupils;

* the behaviour of teachers, with effective schools providing good models of behaviour through teachers exhibiting good time keeping and a clearly apparent willingness to deal with pupils' personal and social problems;

* management in the classroom, with effective schools possessing teachers who prepared lessons in advance, who kept the attention of the whole class, who managed to maintain discipline in an unobtrusive way, who focused upon the rewarding of good behaviour and who were able to take swift action to deal with any disruption by pupils;

* the management structure, with effective schools combining firm leadership by the headteacher with a decision making process in which all teachers felt that their views were represented.

On the other hand, research carried out in Wales (Reynolds et al, 1989) found that more effective schools did have smaller class sizes, more favourable pupil/teacher ratios and were of smaller pupil numbers overall. But other findings were similar to those reported above, and Reynolds (in Riddell & Brown,1991) stresses the importance of an 'incorporative approach', involving pupils and parents. Generally the secondary school studies are in line with those for primary schools. Reynolds notes also that it is not necessarily easy to bring school effectiveness knowledge into ineffective schools.

The research findings reported in this section are based on empirical studies of primary and secondary schools in Britain and other industrialized countries. Of course there are many differences between these schools and typical schools in developing countries, such as resourcing levels, socio-cultural factors, educational background of the teachers, and patterns of organisation. Nevertheless, there may be lessons to be learnt. One striking feature is that the findings relate much more to process than to input, and it may be that research in developing countries should pay much more attention to the former. Fuller (1987) is among those who make this point. He argues that we should not just focus on the effects of material inputs, such as textbook availability or overall school expenditure levels, but ask how material ingredients actually are mobilized and organized within schools and classrooms.

It could be that significant progress would be made in Third World school effectiveness by greater attention to some or all of the process variables such as classroom management, school climate, and institutional leadership. The cost of improvements in these areas would be low in comparison with large scale material inputs, and the key would appear to be in-service training for teachers, school principals and inspectors.

It is true that there is relatively little research evidence on the effects of process variables on schools in developing countries, and it could be argued that school effectiveness research findings from industrialized countries are invalid in a Third World context. The opposing view is that there are enough similarities among schools worldwide to suggest that researchers, planners and policy-makers in developing countries should at the very least be aware of these findings. The meta-analysis is particularly useful for this purpose, and there is an increasing volume of published work at this level (see Kulik & Kulik, 1989).

It is not the purpose of this report to review this research but it is worth giving an example of the type of findings which might have applications in developing countries as well as in developed countries. This example is from research on the effectiveness of mastery learning strategies.

> A meta-analysis of findings from 108 controlled evaluations showed that mastery learning programs have positive effects on the examination performance of students in colleges, high schools and the upper grades in elementary schools. The effects appear to be stronger on the weaker students in a class ..... Mastery programs have positive effects on student attitudes toward course content and instruction but may increase student time on instructional tasks.
> (Kulik et al, 1990, p265)

The meta-analysis found that, on the average, such programs raise final examination scores by about 0.5 standard deviations, which compares very favourably with effects from other innovatory learning strategies. For example, peer and cross-age tutoring programs give average improvements of 0.4 standard deviations.

The effects reported here are so large that there is a strong case for further projects in these areas. However, the introduction of a mastery learning program in a developing country would be likely to require significant material inputs in addition to in-service training for the teachers. As with many promising innovations, a necessary first step would be small scale experimentation.

SECTION 7: POLICY IMPLICATIONS

Lockheed & Verspoor (1991) focus on improving primary education, and categorise a range of investment options as 'promising avenues' or 'blind alleys' as follows (a blind alley may be ineffective, or too expensive):

	promising avenues	blind alleys
curriculum	improve implemented curriculum	adjust intended curriculum
learning materials	good textbooks/ teacher guides	computers in classroom
time	at least 25 hours per week for core subjects of reading and maths	class size reductions below 40-50 students
teaching	inservice training, interactive radio instruction, programmed material	lengthy preservice pedagogical straining
teachability	preschools targeted at disadvantaged, snacks/ breakfast, micro-nutrient supplementation, parasite treatment, vision and auditory screening.	school lunches

Several of these points are reinforced in USAID (1990), quoted in Singh (1991, p50) in particular

* programmed teaching/learning systems provide an effective, affordable and sustainable means to improve the quality of primary education, especially in settings where teachers are poorly trained and in short supply.

* interactive radio instruction (IRI) has improved levels of student achievement significantly in traditional primary schools during the past 15 years at very low cost. IRI has also increased access to primary education through non-formal radio schools.

* typical preservice teacher training contributes little to educational quality; inservice training may be more effective and is less costly.

Cohn & Rossmiller (1987) consider methodological aspects of school-effectiveness research, and conclude that

> Although all the school-effectiveness research is based on imperfect methodologies and data, the vast experience gained from research in both developed and less developed countries (LDCs) provides a few guidelines for educational policy in the developing countries. (p378)

They argue that although there are differences between developed countries and LDCs, there are also great similarities in the determinants of academic performance. They draw the following implications for educational policy in LDCs:

> Money is necessary but not a sufficient requisite to more effective schools .... The research provides no definitive answer to the question of at what level of spending do marginal returns turn down .... It is evident that adequate facilities, equipment, books and other instructional materials are necessary if a school is to be effective, but it is also evident that facilities and materials alone will not insure effectiveness if those who teach in them are not competent or if their decision making is unduly constrained. Conversely, highly competent teachers will find it difficult to teach effectively in inadequate facilities or if they are lacking the necessary instructional materials. The research provides no basis for concluding that LDCs should reduce their level of expenditure for education or be unconcerned about educational facilities. The findings do suggest that .... attention must increasingly be directed to how resources are used in the educational process.
>
> (pp 393-394)

Cohn & Rossmiller also discuss organisational factors:

> The research on effective schools also draws attention to the importance of the decision-making process within the school .... It is important that national/state policies concerning education establish appropriate parameters for school and classroom decisions but also that they provide sufficient leeway for those decisions that can best be made at the school and the classroom level .... The research on effective schools highlights the limitations of a top-down strategy to change schools and classrooms ....The research on effective

> schools emphasizes the importance of the decisions made by school principals and teachers (about how to use the available resources) .... It is necessary to attract competent individuals to careers in teaching, provide them with appropriate training to develop their knowledge base and pedagogical skill, and create conditions and incentives to retain able teachers and administrators in the schools. Both monetary factors (e.g. salaries and opportunities for advancement) and nonmonetary factors (e.g. status, esteem and respect) are important.
>
> (pp 394-396)

Further policy implications of the research, according to Cohn & Rossmiller (1987) are:

> A program of staff development is characteristic of effective schools .... The process used in planning and implementing such programs also is important .... Evidence from both developed countries and LDCs suggests that how, and how much, time is used for both in-school and out-of-school learning may be extremely important .... The trade-off between class size and other inputs must proceed very cautiously .... Another area of potential benefits is examination reform .... Preschool programs might provide benefits from both efficiency and equity standpoints. (pp 396-397)

They emphasize that policies to improve education in LDCs must be carefully designed and monitored to tailor the reform to the economic and cultural background of the individual countries.

> In the majority of LDCs, however, where educational expenditures are woefully inadequate, extra funds for textbooks, distance education, teacher training, and other instructional and non-instructional resources could have a substantial effect on educational quality (p 399)

But Cohn & Rossmiller admit that their survey "still does not provide a precise list of priorities for the use of new funds".

SECTION 8: CONCLUSIONS

It is clear from the research evidence (and from common sense) that school effectiveness can be influenced by inputs of various kinds. However the evidence is insufficiently precise to be used to assign a rank order to proprieties, and in any case the relative effectiveness and efficiency of alternative inputs are likely to be context dependent. Nevertheless it does seem possible to produce some guidelines for decision-making with regard to education aid policy. The remainder of this section consists of suggestions for such guidelines.

8.1 Teacher Quality

In most countries, investment in teacher training and/or improving teacher morale is sound. Shorter pre-service training and greater emphasis on in-service training seems to be the appropriate mix.

8.2 Books & Materials

Provision of appropriate books (up to a 2:1 pupil:book ratio) and instructional materials should be a priority. Programmed teaching/learning systems may be appropriate in some cases; in any case effectiveness depends on utilisation.

8.3 Curriculum

Improvement of the implemented curriculum is more effective than curriculum reform.

8.4 Teaching methods

Where appropriate, such techniques as multigrade teaching, peer tutoring, cooperative learning, a mystery approach, and interactive radio instruction can be effective/efficient.

8.5 Examinations

Examination reform can improve quality. Assessment should be focused more on success and less on failure.

8.6 School facilities

The provision of basic school physical facilities (eg. desks, chalk, latrines) is important. However, lavish buildings and equipment (eg computers) are not cost-effective.

8.7 School organisation

Decreasing class size is not cost-effective but increasing instructional time is. It is desirable to encourage community involvement and homework and to discourage grade repetition. A multiple-shift system may be cost-effective.

8.8 Education management

Good decentralised management is important. Therefore investment in management training (eg. for school principals and/or inspectors) is sound.

8.9 Teachability

If resources permit, provision of preprimary education and measures to improve child health can both increase quality.

BIBLIOGRAPHY

Avalos,B & Haddad,W (1981) **A Review of Teacher Effectiveness Research in Africa, India, Latin America, Middle East, Malaysia, Philippines and Thailand: Synthesis of Results** Ottawa:IDRC

Bacchus,K et al (1991) **Curriculum Reform** London: Commonwealth Secretariat

Benavot,A (1992) Curricular content, educational expansion and economic growth **Comparative Education Review** 36,2,150-174

Bray, M (1989) **Multiple-shift Schooling: Design and Operation for Cost-Effectiveness** London: Commonwealth
Secretariat

Cohn,E & Rossmiller,RA (1987) Research on effective schools: implications for less developed countries **Comparative Education Review** 31,3,377-399

Creemers,B, Peters,T & Reynolds,D (eds,1989) **School Effectiveness and School Improvement** Rockland, Mass: Swets & Zeitlinger

Cuttance,P (1988) Intra-system variation in the effectiveness of schooling **Research Papers in Education** 3,3,180-216

Dore,RP (1976) **The Diploma Disease** London: Allen & Unwin

Fuller,B (1987) What school factors raise achievement in the Third World? **Review of Educational Research** 57,3,255-292

Fuller,B & Heyneman,SP (1989) Third World school quality: current collapse, future potential **Educational Researcher** 18,2,12-19

Guthrie,G (1982) Reviews of teacher training and teacher performance in developing countries: Beeby revisited (2) **International Review of Education** 28,3,291-306

Haddad,WD et al (1990) **Education and Development: Evidence for New Priorities** World Bank Discussion Papers 95

Hallak,J (1990) **Investing in the Future: Setting Educational Priorities in the Developing World** IIEP/Pergamon

Hawes,H & Stephens,D (1990) **Questions of Quality: Primary Education and Development** Longman

Heyneman,SP (1987) Uses of examinations in developing countries: selection, research and education sector management **International Journal of Educational Development** 7,4,251-263

Heyneman,SP (1989) Multilevel methods for analysing school effects in developing countries **Comparative Education Review** 33,4,498-504

Heyneman,SP & Loxley,WA (1983) The effect of primary school quality on academic achievement across 29 high- and low-income countries **American Journal of Sociology** 88,6,1162-1194

Heyneman,SP & Ransom,AW (1990) Using examinations and testing to improve educational quality **Educational Policy** 4,3,177-192

Heyneman,SP et al (1984) Textbooks in the Philippines: evaluation of the pedagogical impact of a nationwide investment **Educational Evaluation and Policy Analysis** 6,2,139-150

Kellaghan,T & Greaney,V (1992) **Using Examinations to Improve Education: A Study in Fourteen African Countries** World Bank Technical Paper number 165

Kulik,C-L et al (1990) Effectiveness of mastery learning programs: a meta-analysis **Review of Educational Research** 60,2,265-299

Kulik,JA & Kulik,C-L (1989) Meta-analysis in education **International Journal of Educational Research** 13,221-340

Levin,HM & Lockheed,ME (1991) **Effective Schools in Developing Countries** World Bank document no PHREE/91/38

Lewin,K with Ross,AR (1992) **Dialogue for Development: A Policy Review of British Educational Aid towards 2000** Unpublished ODA report

Lillis, KM (1992) **Improving basic education: preconditions for successful inspection and supervision-implications for training** Monngraph no.7. Pairs: International Institute for Educational Plaining

Lockheed,ME & Hanushek,E (1988) Improving educational efficiency in developing countries: what do we know? **Compare** 18,1,21-38

Lockheed,ME & Verspoor,A (1991) **Improving Primary Education in Developing Countries** World Bank/OUP

Lockheed,ME et al (1986) How textbooks affect achievement in developing countries: evidence from Thailand **Educational Evaluation and Policy Analysis** 8,4,379-392

Lulsegged,A (1988) Assessment of impact of SIDA assistance to the Swaziland government Unpublished manuscript

Mortimore,P et al (1988) **School Matters: The Junior Years** Salisbury: Open Books

Mwamwenda,TS & Mwamwenda,BB (1987) School facilities and pupils' academic achievement **Comparative Education** 23,2,225-235

Neuman,S & Ziderman,A (1989) Vocational schools **can** be more cost-effective than academic schools: the case of Israel **Comparative Education** 25,2,151-163

Nitsaisook,M & Postlethwaite,TN (1986) Teacher effectiveness research: an example from Thailand **International Review of Education** 32,4,423-438

Oxenham,J (ed,1984) **Education versus Qualifications**? London: George Allen & Unwin

Pennycuick,DB (1990) The introduction of continuous assessment systems at secondary level in developing countries, in P.Broadfoot et al (eds) **International Changes in Education Assessment** London: Routledge

Pennycuick,DB (1991) Moderation of continuous assessment systems in developing countries **Compare** 21,2,145-152

Psacharopoulos,G (1987) To vocationalize or not to vocationalize: that is the curriculum question **International Review of Education** 33,2,187-211

Psacharopoulos,G & Loxley,W (1985) **Diversified Secondary Education and Development** London:OUP

Raudenbush,SW et al (1991) The effects of preprimary access and quality on educational achievement in Thailand **Comparative Education Review** 35,2,255-273

Raudenbush,SW & Willms,JD (eds,1991) **Schools, Classrooms & Pupils: International Studies from a Multilevel Perspective** New York: Academic Press

Reynolds,D et al (1989) The Cardiff Programme - an effective school improvement programme based on school

effectiveness research, in Creemers,BPM and Scheerens,H (eds) **Developments in School Effectiveness Research** (Special issue of the **International Journal of Educational Research** 13,7,800-814

Riddell,AR (1989) An alternative approach to the study of school effectiveness in Third World countries **Comparative Education Review** 33,4,481-497

Riddell,S & Brown,S (eds,1991) **School Effectiveness Research: Its Messages for School Improvement** Edinburgh: HMSO

Riddell, AR & Nyagura, LM (1991) **What Causes Differences in Achievement in Zimbabwe's Secondary Schools?** PRE Working Papers WPS 705, The World Bank

Rutter,M et al (1979) **Fifteen Thousand Hours: Secondary Schools and their Effects on Children** London: Open Books

Saha,LJ (1983) Social structure and teacher effects in academic achievement: a comparative analysis**Comparative Education Review** 27,1,69-88

Schiefelbein,E & Simmons,J (1981) **The Determinants of School Achievement: a Review of the Research for Developing Countries** Ottawa:IDRC

Singh,JS (1991) A review of selected international development programmes in basic education, in K.King & J.S.Singh **Quality and Aid** Commonwealth Secretariat

Somerset,HCA (1988) Examinations as an instrument to improve pedagogy, in SP Heyneman & I Fagerlind (eds) **University Examinations and Standardized Testing** Washington: The World Bank

Thomas,C & Shaw,C (1992) **Issues in the Development of Multigrade Schools** World Bank Technical Paper no.172

Throsby,CD & Gannicott,K (1990) The quality of education in the South Pacific **Pacific Economic Bulletin** June, 1990

Tipple,C (1990) Reactions from a CEO, in C.Fitz-Gibbon (ed) **Performance Indicators** BERA Dialogues 2 Clevedon: Multilingual Matters

Urwick,J & Junaidu,SU (1991) The effects of school physical facilities on the processes of education: a qualitative study of Nigerian primary schools **International Journal of Educational Development** 11,1,19-29

USAID (1990) **Basic Education Workshop: Lessons Learned** Washington DC, February 15-16, 1990

Vulliamy,G (1987) School Effectiveness Research in Papua New Guinea **Comparative Education** 23,2,209-223

Wilcox,B (1990) Performance Indicators: the search for the holy grail of quality, in C.Fitz-Gibbon (ed) **Performance Indicators** BERA Dialogues 2 Clevedon: Multilingual Matters

Willms,JD (1992) **Monitoring School Performance** The Falmer Press

Appendix A Extract from Terms of Reference

OBJECTIVES

i. To determine the relative significance of factors influencing pupil attainment at primary and secondary level;
ii. To determine the relative cost-effectiveness of specific interventions.

STRATEGY

Literature/research (relevant to LDCs) on:

i. School effectiveness (including management; organisation; instructional leadership; streaming; time; the nature of the instructional programme);

ii. Teacher effectiveness (including training pre-set and insert , support, upgrading, conditions of service);

iii. Quality control mechanisms (including testing, measurement, profiling etc);

iv. Processes of examinations, pupil assessment, examination reform;

v. Processes of curriculum and curriculum development reform; materials development and curriculum.

APPENDIX B

Educational Efficiency in Developing Countries (from Lockheed & Hanushek, 1988)

Table III. Efficiency of six educational policies

	Effect size[a]	cost per-student	Efficiency[b]
Testbooks			
Brazil[c]	.34	$1.65	.21/$1
Nicaragua[d]	.36	$1.75	21/$1
Philippines[e]	.40	£0.27	1.48/$1
Thailand[f]	.06	$ .40	1.33/$1
Radio education			
Kenya[g]	.53	$ .40	1.33/$1
Njicaragua[h]	.55	$1.80	.31/$1
Thailand (Norteast)[i]	.58	$ .44	1.31/$1
Teacher education			
Brazil (4yrs Primary)	.21	$2.21	.09/$1
Brazil (Logos II)	.09	$1.84	.05/$1
Brazil (3 yrs secondary)	.16	$5.55	03/$1
Thailand (additional semester postsecondary)	<.01	$ .09	.06/$1
Technical-Vocational Secondary[j]			
Colombia (INEM)	.39	$ 98.00	.40/$100
Colombia (tech-voc.)	.33	$376.00	.09/$100
Tanzania (commercial)	.50	$272.00	.18/$100
Tanzania (technical)	— .37	$561.00	— .07/$100
Tanzania (agricultural)	— .20	$375.00	— .05/$100
Cross-Age Peer Tutoring[k]			
United States	.73	$212.00	.34/$100
Cooperative learning[l]			
Israel	1.40	$85.00	1.65/$100

Note:

[a] The effect size is the average score difference between treatment and control groups divided by the standard deviation of the control group (Glass, McGaw & Smith, 1981).
[b] Efficiency is the effect size divided by the per-student cost.
[c] Source for Brazil: Armitage *et al.* (1986).
[d] Source: Jamison *et al.* for effect: Wells & Klees (1978) for cost
[e] Source: Heyneman *et al.*(1989) for effect: Searle (personal communication) for cost.
[f] Source: Lockheed *et al.* (1987)
[g] Source: Oxford *et al.* (1986) for effect: Kemmerer & Friend (1985) for cost.
[h] Source: Searle & Galda (1980) for effect: Wells & Klees (1978) for cost.
[i] Source: Friend *et al.* (1986) for effect: Galda (1985) for cost.
[j] Source: Psacharopoulos & Loxley (1985).
[k] Source: Levin *et al.* (1984).
[l] Source: Sharan & Shacher (1986).

DFID

Department for International Development
94 Victoria Street
London SW1E 5JL

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